Summary of Fishery Surveys
Fireside Lakes, Rusk County, 2016-2017

WDNR's Fisheries Management Team from Park Falls completed fyke netting and electrofishing surveys in 2016 and 2017 to assess the status of important fish populations in Fireside Lakes. Fyke netting in fall 2016 yielded useful information on black crappie. Fyke nets set again about two weeks after the spring 2017 thaw specifically targeted adult muskellunge, and our spring netting survey also helped us discern the population status of walleye, northern pike, and yellow perch. A late-spring electrofishing survey documented the abundance and size structure of largemouth bass and bluegill populations. Quality, preferred, and memorable sizes referenced in this summary are based on standard proportions of world record lengths developed for each species by the American Fisheries Society. "Keeper size" is our own description applied to bluegill ≥ 7 inches and black crappie ≥ 9 inches long, based on known angler behavior.

Survey Effort

On October 24, 2016, we set seven fyke nets and fished them overnight for two nights (14 net-nights of survey effort) to intercept the fall movements of black crappie when water temperature was 51-54°F. About 12 days after ice-out on April 13, 2017, we again set seven fyke nets at locations chosen to intercept early-spring spawners and fished them overnight for eight nights (56 net-nights) when water temperature was 47-54°F. In spring and fall we placed four nets in the large basin and three in the small basin. Fall nets were tended daily. Spring nets fished two consecutive nights before we checked our catch four times on alternate days. Comparing measured water temperature with the optimal spawning temperature range of the targeted species, spring netting coincided well with the peak of muskellunge spawning activity, but our survey likely occurred as pike, perch, and walleye spawning was subsiding. Due to the shallow, gradually-sloping topography of the near-shore lakebed, effective netting locations with 4-foot depth were scarce in both basins. Fyke nets with 75-foot leads were better suited than those with 50-foot leads. Fireside Lakes' uncontrolled level was about one foot lower than normal at the start of our spring netting survey, but lake elevation returned to normal before our survey ended. With water temperatures at 72°F, our June 5, 2017 electrofishing survey was well timed to represent the relative abundance and size structure of spawning largemouth bass and bluegills that in Fireside Lakes' clear water we could see on their nests. We sampled 3.52 miles of shoreline in 1.60 hours, including 1.00 mile sub-sampled for panfish in 0.53 hour.

Habitat Characteristics

Fireside Lakes is a 302-acre, drainage lake with two-basins, located about 13 miles south of Bruce, WI. Swift Creek discharges from the fixed-crest dam on Island Lake and flows nearly 3 miles into the 84-acre southwest basin, sometimes called Mud Lake. An unnamed stream discharges from the dam on Goose

Lake to the west side of Mud Lake. Rice Creek drains to the Chippewa River from the 218-acre northeast basin, locally known as Rice Lake. Maximum depth is 30 feet in Rice Lake and 14 feet in Mud Lake. Water clarity is moderately high (summer Secchi disk visibility = 6 – 11 feet). Fireside Lakes are categorized as eutrophic, hardwater lakes with moderately high biological productivity and moderate concentrations of nutrients and dissolved minerals. The lakebed is comprised of 60% sand, 10% gravel, and 30% muck—mostly fine-particle substrates that support a mid-range density of submersed and emergent vegetation. All of Swift Creek and portions of Mud Lake, Rice Lake, and Rice Creek are designated as *Areas of Special Natural Resource Interest* to recognize their critical habitat, sensitive areas, and exceptional resource values. Shoreland vegetation is mainly upland hardwoods and conifers with some tag alder. Aquatic invasive species include Chinese mystery snails and curly-leaf pondweed. Visitors have access to the lake at the public boat landing maintained by Rusk County on the northeast shore.

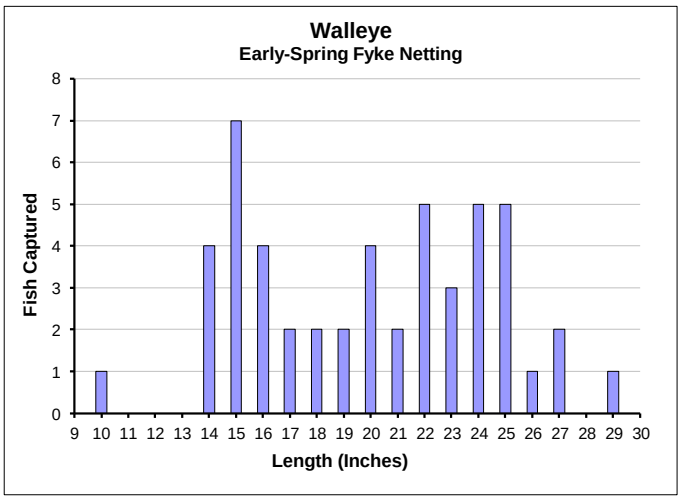
Summary of Results

We captured 20 fish species in our netting and electrofishing surveys, nearly matching the species richness (n=21) we found in 2009–2010 with similar survey effort. High fish species diversity can be attributed to Fireside Lakes' direct connection with the Chippewa River. Largemouth bass and northern pike were the principle predators and bluegill were the most abundant panfish species. Yellow perch, white suckers, and redhorse complemented the forage base. Our samples included walleye and muskellunge in low abundance. We again noted the presence of lake sturgeon when we saw, but did not capture, one in our electrofishing survey. Spring fyke nets also captured two channel catfish 30.1 and 30.6 inches long.

Walleye

Early Spring Fyke Nets

Captured 1.1 per net-night ≥ 10"	
Quality Size ≥ 15"	90%
Preferred Size ≥ 20"	56%
Memorable Size ≥ 25"	18%



Our low fyke-net capture rate of walleyes may not truly reflect adult population abundance in Fireside Lakes because our survey occurred after the peak spawning period. A few females in our sample were still not ready to release their eggs, but most were no longer gravid. New recruits to the adult population come from a combination of natural reproduction and stocking, but we have not recently evaluated the relative contributions from these sources. Fireside Lakes received walleyes stocked at a rate of 15 large fingerlings per acre in 2013, 2015, and 2017. Small fingerlings averaging 1.6 inches long were stocked at rates of 100, 50, or 35 per acre annually or biennially in 1999–2011. Many of the 14- to 16-inch fish are likely survivors from the large fingerlings stocked in 2013, and the larger fish probably stem from the small fingerling plants. The length distribution of walleye our sample included many age classes. However, the percentages of quality-, preferred-, and memorable-size fish were mathematically inflated

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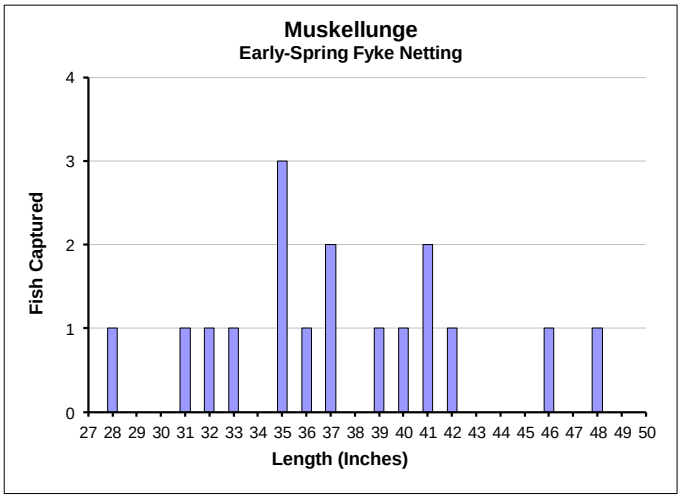
because we caught virtually no walleyes 10–13 inches long, perhaps because the 2015 year class did not survive, or because it was not yet vulnerable to capture in fyke nets. Though we did not take bony structures to analyze their growth rate, with the ample forage available in nutrient-rich Fireside Lakes, the walleye population appears capable of producing trophy-size fish exceeding 30 inches long.

Muskellunge

Early Spring Fyke Nets

Captured 0.4 per net-night ≥ 20"	
Quality Size ≥ 30"	94%
Preferred Size ≥ 38"	41%
Memorable Size ≥ 42"	18%



The capture rate and length distribution of muskellunge in our spring fyke-netting effort directed toward this species indicated an adult population in low abundance with very good size structure that should make even the most discriminating musky anglers happy. The average fyke net catch rate in muskellunge populations sustained by natural reproduction is about 0.9 adults per net-night. Of the 19 muskies in our spring nets, nearly half were 38 inches or longer, a fifth attained 42 inches, and the longest was 48.5 inches. Apparently, redhorse, white suckers, and yellow perch provide muskellunge with efficient rations of their favorite foods so that muskies can grow at a satisfactory rate toward trophy size ≥ 50 inches long. Recruitment stems from a combination of in-lake production and presumed movement from the Chippewa River—we found no record of authorized musky stocking into Fireside Lakes. Muskellunge population status changed little since our last assessment in 2010 when 14 net-nights of fyke-netting captured 0.6 adults per net-night and 43% were 38 inches or longer.

In lieu of reliable age analysis which requires lethal sampling, we injected a passive integrated transponder (PIT) tag into the cheek of all muskies captured in our 2016-2017 surveys. PIT tags are about the size of a grain of rice and identical to those used for pet identification. When activated by a scanner, the PIT tag returns a unique code on the scanner's display to identify individual fish over their lifetime. Eventually, we will better understand muskellunge growth rate as we tag more fish in various age classes and recapture them in future surveys. At 7-year frequency, the next surveys in Fireside Lakes are scheduled in fall 2023 and spring 2024. However, we may encounter muskies as bycatch, if our time and budget allow us to evaluate walleye recruitment by fall electrofishing before then.

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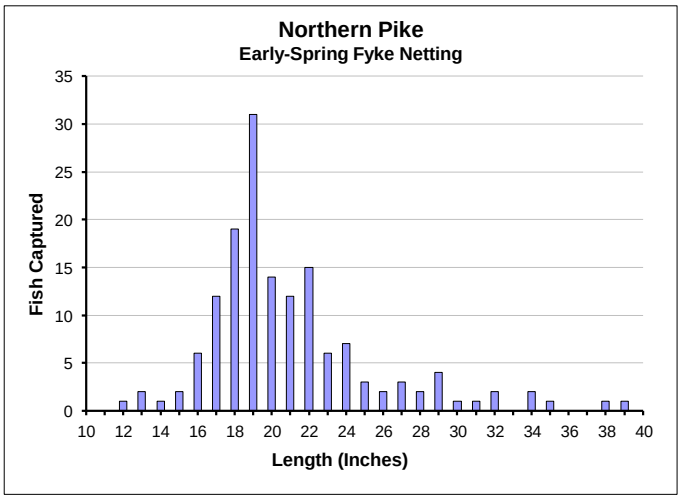
Northern Pike

Early Spring Fyke Nets

Captured 2.9 per net-night ≥ 14"	
Quality Size ≥ 21"	43%
Preferred Size ≥ 28"	10%
Memorable Size ≥ 34"	3%

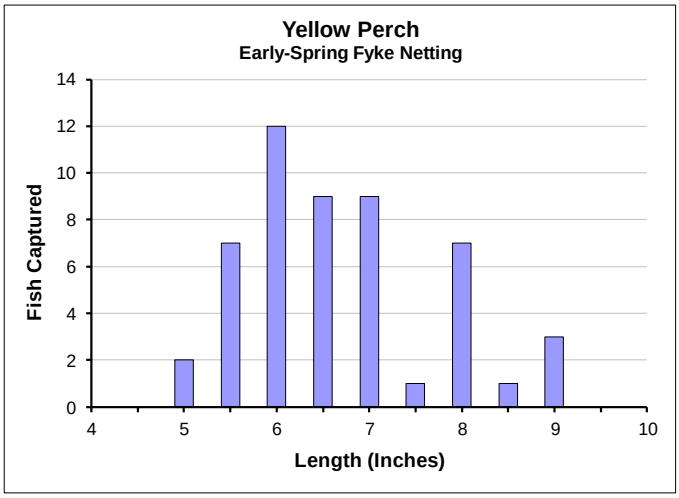


Despite the late timing of our netting survey in relation to typical northern pike spawning activity, our 2017 catch rate of northern pike nearly tripled from our last survey in 2010 when spring fyke nets captured 1.0 fish ≥ 14 inches long per net-night. Over the same period, the proportion of preferred-size pike decreased from 57%, while the share of memorable-size pike 34 inches or longer increased from 0%. These apparent changes in pike abundance and size structure probably reflect the substantial differences in netting effort and sample size in 2010 and 2017 (14 versus 56 net-nights and 4 versus 166 fish), more so than any real change in population status. Though we did not confirm the population's age composition by examining bony structures, the length distribution of our 2017 sample shows most of the population stems from several strong year classes probably produced in 2012–2014 that have grown to 18–22 inches long. The longest pike in our contemporary sample was a 39.6-inch female. We believe our current capture rate still represents the low to moderate population abundance needed to keep pike growing at a satisfactory rate to the sizes that anglers like to catch. If the noted change in catch rate does indeed reflect a three-fold rise in pike abundance and an upward trend continues, then the population's growth rate and size structure may eventually decline as competition among pike for food and space intensifies. A large increase in pike abundance could also suppress natural recruitment to the muskellunge population.

Yellow Perch

Early Spring Fyke Nets

Captured 1.3 per net-night ≥ 5"	
Quality Size ≥ 8"	22%
Preferred Size ≥ 10"	0%
Memorable Size ≥ 12"	0%



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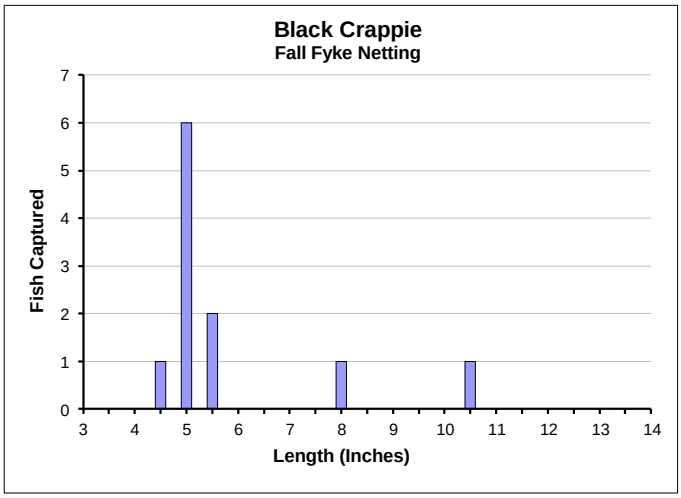
Early spring 2017 fyke nets captured yellow perch at a very low rate, compared to 2010 when spring netting produced 10 perch per net-night. This decrease in our measure of perch abundance has improved the population's size structure—only 1% of 143 perch ≥ 5 inches in spring 2010 fyke nets attained quality size. Yellow perch are the favorite food of walleye, muskies, northern pike, and largemouth bass, and adult pike and muskellunge selectively eat the largest perch to optimize the return on the energy they invest in feeding. With perch satisfying the food demands of other sportfish populations to keep them growing fast, anglers should not expect to catch many large perch as table fare in Fireside Lakes.

Black Crappie

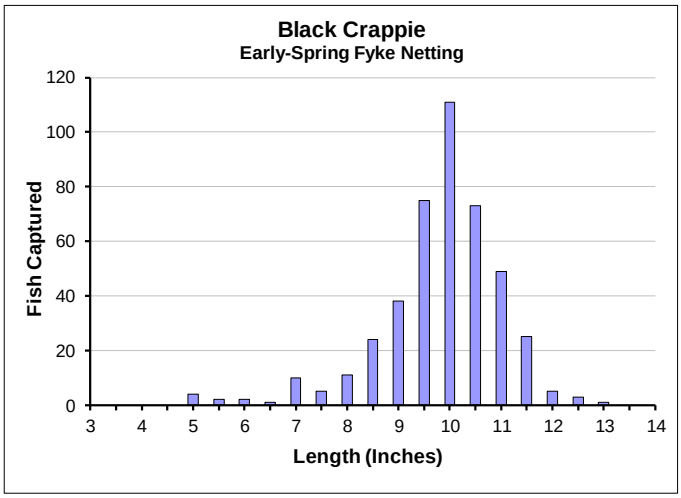
Fall Fyke Nets

Captured 0.7 per net-night ≥ 5"	
Quality Size ≥ 8"	20%
Preferred Size ≥ 10"	10%
Memorable Size ≥ 12"	0%



Early Spring Fyke Nets

Captured 9.4 per net-night ≥ 5"	
Quality Size ≥ 8"	95%
Preferred Size ≥ 10"	61%
Memorable Size ≥ 12"	2%



Our large sample from early spring 2017 fyke nets represented the population status of black crappies much better than the handful we caught by netting in fall 2016. By contrast, fyke nets captured crappies at similar rates in fall 2009 (1.6 per net-night) and spring 2010 (1.4 per net-night). Even with a nearly six-fold increase in fyke net catch rate since our 2009-2010 surveys, population abundance remains moderate enough to keep crappies growing faster than the average rate. Age analysis using otoliths revealed that black crappies in Fireside Lakes were on average 10.0 inches long at age 5 (range 9.9-10.1;

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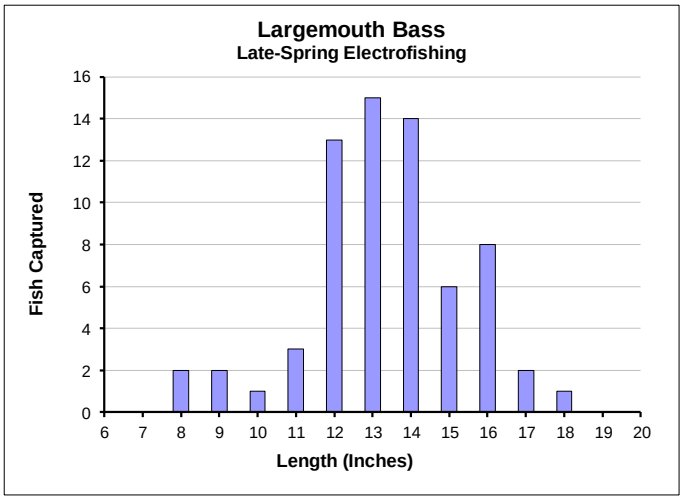
n=9), compared to the regional average of 9.3 inches at that age. The length distribution of our spring sample shows a strong year class hatched in spring 2012 that grew to preferred size in 5 years. With 3 of 5 crappies at least 10 inches long anglers should have ample opportunity to catch a meal for several more years, provided that the news of good fishing does not quickly deplete the 2012 year class under current harvest regulations that allow anglers to keep 25 panfish daily. WDNR's 3-year rule-making process moves too slowly to protect the 2012 crappie year class in Fireside Lakes. However, the Fireside Lakes Association could post signs to encourage anglers to limit their harvest to 5 or 10 crappies daily. Promoting voluntary harvest restriction could extend the period of good crappie fishing and distribute the harvest more equitably among anglers. We forecast an interruption in good crappie fishing after the 2012 year class fades away from harvest or natural causes. The length distribution with few crappies ≤ 8 inches long indicated that the population produced very few new recruits since 2012. Sporadic recruitment is common in black crappie population, and year class production is thought to be influenced mainly by environmental variable, including water temperature, water levels, and wind/wave intensity in late spring and early summer.

Largemouth Bass

Late Spring Electrofishing

Captured 19 per mile or 42 per hour ≥ 8"	
Quality Size ≥ 12"	88%
Legal Size ≥ 14"	46%
Preferred Size ≥ 15"	25%



The capture rate and length distribution from our late spring 2017 electrofishing survey indicated largemouth bass in moderate numbers with good size structure. Although our measure of population abundance increased from 12 bass per mile in spring 2010, the average length of bass increased from 11.2 to 13.9 inches and the proportion of bass 15 inches or longer increased from 9% to 25% between our 2010 and 2017 electrofishing samples. Largemouth bass have potential to attain memorable size 20 inches or longer in Fireside Lakes; in 2016-2017 the largest bass was 21.6 inches, captured in spring netting. Habitat, water clarity, aquatic plant density, and forage are favorable for sight-feeding largemouth bass in Fireside Lakes, so the population should retain its healthy status as long as anglers continue to release the larger bass, as we suspect they do, and direct any harvest that may occur toward the abundant fish just over the 14-inch minimum length limit.

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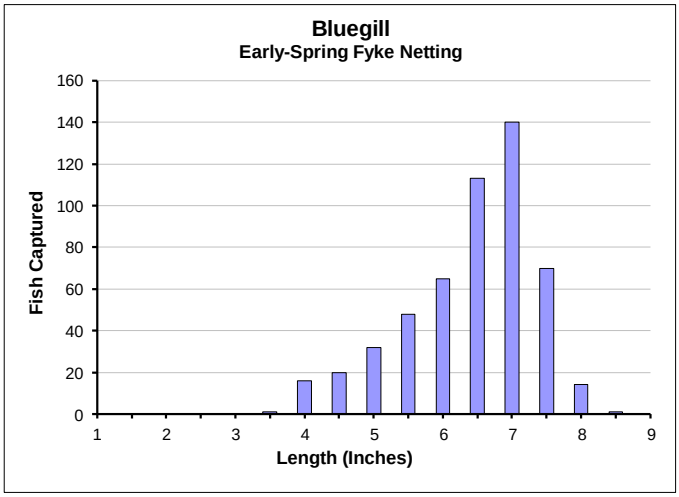
Bluegill

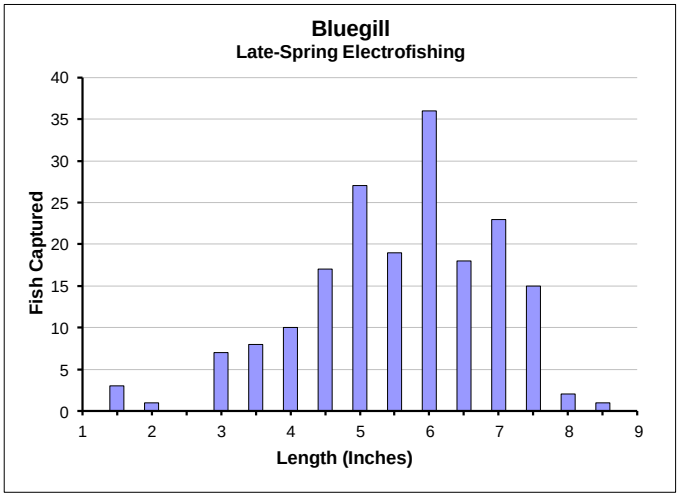
Early Spring Fyke Nets

Captured 12 per net-night ≥ 3"	
Quality Size ≥ 6"	78%
Keeper Size ≥ 7"	43%
Preferred Size ≥ 8"	3%



Late Spring Electrofishing

Captured 183 per mile or 345 per hour ≥ 3"	
Quality Size ≥ 6"	52%
Keeper Size ≥ 7"	22%
Preferred Size ≥ 8"	2%



Comparing capture rates of bluegill in late-spring electrofishing surveys, our index of population abundance has changed little since 2010 when we captured 336 bluegills per hour. With a moderate to slightly high number of mouths to feed, the population manages to produce a fair share of keeper-size fish. Proportions of bluegills 7 inches or longer increased substantially from 3% in our 2010 electrofishing survey and 10% in spring 2010 fyke nets. All netting and electrofishing samples in 2016 and 2017 had 2–3% of bluegills ≥ 8 inches long, whereas we captured only one preferred-size bluegill in our 2010 surveys. Increased predatory pressure may be controlling bluegill recruitment to prevent crowding, intense food competition, and impaired growth that can often occur when bluegills become too abundant. The steep decline at 7½ inches in the length distribution from both spring 2017 surveys suggests that anglers are selectively harvesting the largest bluegills faster than the population can replace them. By voluntarily limiting their take of bluegills ≥ 8 inches to no more than 5 daily, anglers can help protect and replenish the large parental male bluegills that limit the population's reproductive success and abundance by social and behavioral mechanisms.

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Survey data collected and analyzed by: Evan Sniadajewski, Matthew Anchor, Kendal Patrie, Chad Leanna, and Jeff Scheirer—WDNR Fishery Team, Park Falls.

Written by: Chad Leanna—Fishery Technician, January 19, 2018.

Edited by: Jeff Scheirer—Fishery Biologist, January 31, 2018.

Reviewed and approved for web posting by: Mike Vogelsang—Northern Administrative District Supervisor, July 15, 2019.

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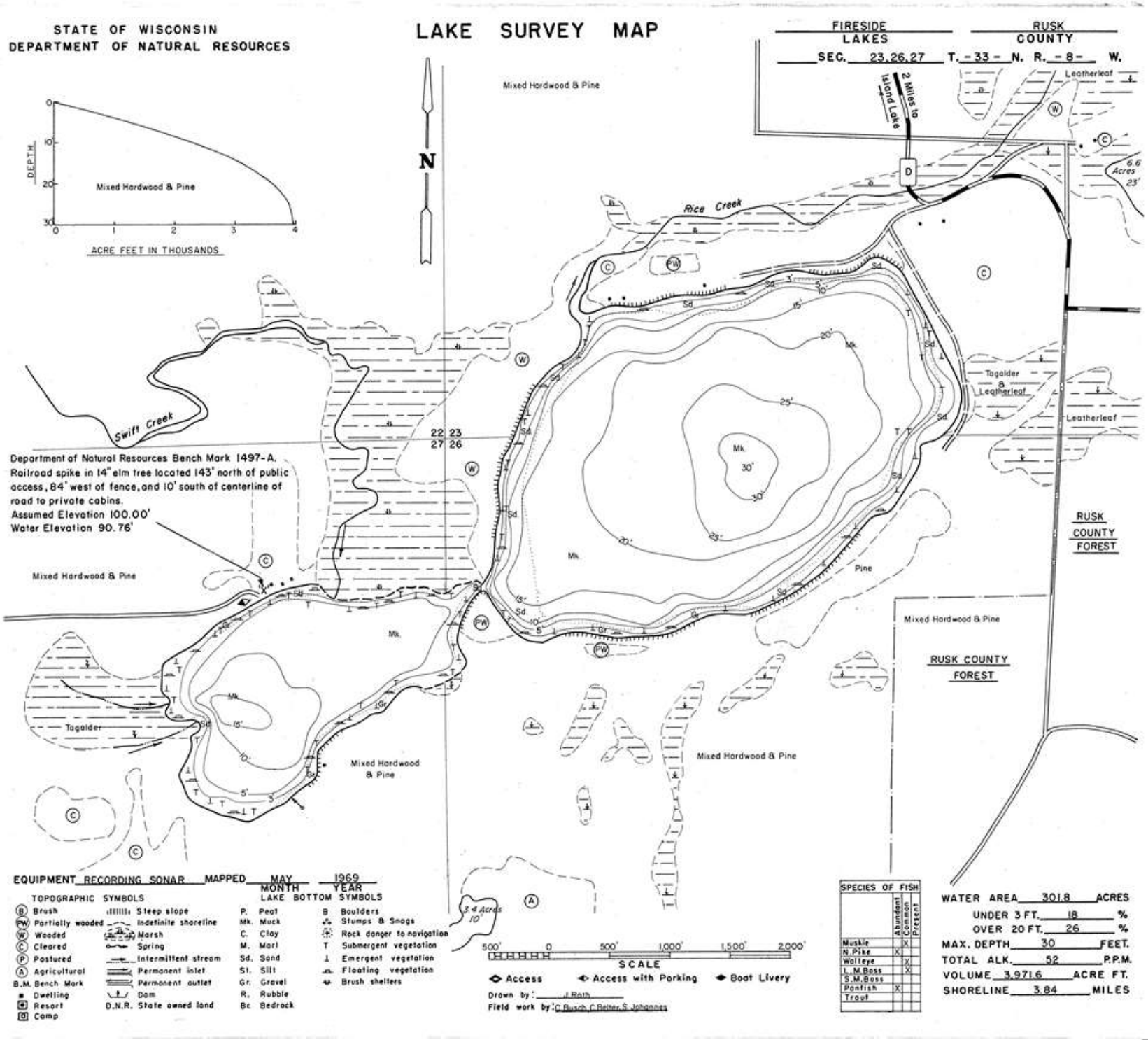
STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES
LAKE SURVEY MAP
FIRESIDE LAKES
RUSK COUNTY
SEC. 23,26,27 T. -33- N. R. -8- W.
DEPTH
ACRE FEET IN THOUSANDS
Mixed Hardwood & Pine
N
2 Miles to Island Lake
Leatherleaf
Rice Creek
6.6 Acres 23'
Swift Creek
22 23
27 26
Department of Natural Resources Bench Mark 1497-A.
Railroad spike in 14" elm tree located 143' north of public access, 84' west of fence, and 10' south of centerline of road to private cabins.
Assumed Elevation 100.00'
Water Elevation 90.76'
Tag alder & Leatherleaf
Tagalder
RUSK COUNTY FOREST
Pine
Mixed Hardwood & Pine
Mixed Hardwood & Pine
3.4 Acres 10'
EQUIPMENT RECORDING SONAR MAPPED MAY 1969
MONTH YEAR
TOPOGRAPHIC SYMBOLS
Brush
Partially wooded
Wooded
Cleared
Pastured
Agricultural
B.M. Bench Mark
Dwelling
Resort
Camp
Steep slope
Indefinite shoreline
Marsh
Spring
Intermittent stream
Permanent inlet
Permanent outlet
Dam
D.N.R. State owned land
LAKE BOTTOM SYMBOLS
P. Peat
Mk. Muck
C. Clay
M. Marl
Sd. Sand
St. Silt
Gr. Gravel
R. Rubble
Bc Bedrock
B Boulders
Stumps & Snags
Rock danger to navigation
T Submergent vegetation
Emergent vegetation
Floating vegetation
Brush shelters
500' 0 500' 1,000' 1,500' 2,000'
SCALE
Access
Access with Parking
Boat Livery
Drawn by: J. Roth
Field work by: C. Busch, C. Belter, S. Johannes
SPECIES OF FISH
Abundant
Common
Present
Muskie X
N. Pike X
Walleye X
L. M. Boss X
S. M. Boss
Panfish X
Trout
WATER AREA 301.8 ACRES
UNDER 3 FT. 18 %
OVER 20 FT. 26 %
MAX. DEPTH 30 FEET.
TOTAL ALK. 52 P.P.M.
VOLUME 3,971.6 ACRE FT.
SHORELINE 3.84 MILES